

The Ruth H. Hooker Research Library

and Technical Information Center



The NRL InfoNet: A Menu-driven System Offering End Users Pre-programmed Access to Internet Resources and Search Tools

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• Abstract:

To provide researchers of the Naval Research Laboratory (NRL) access to information resources at their desktops, the Ruth H. Hooker Research Library and Technical Information Center of NRL has installed a networked information utility, known as the InfoNet. Using a single menuing system, the InfoNet is available from anywhere on the campus FDDI/Ethernet network. Researchers using any type of computing workstation or dumb terminal are provided access to CD-ROM databases, the Library's online catalog, Laboratory management information databases, and state-of-the-art Knowbot prototypes to search the Internet. The InfoNet also makes extensive use of Internet E-Mail to provide Alias accounts, ListServ forums, and to send search results to end-users. The InfoNet system hardware and software itself consists entirely of industry-standard components and makes extensive use of the TCP/IP suite of protocols.

1. INTRODUCTION

The Naval Research Laboratory (NRL) is the Navy's center for theoretical and applied research. NRL research areas include the major scientific disciplines such as physics, chemistry, electronics, and computer technology. The main campus consists of 152 buildings on 130 acres in Southwest Washington, DC, housing approximately 5,000 government employees and contractors. All buildings on the campus are interconnected via a FDDI/Ethernet backbone network, with dedicated T1 and T3 lines connected to the world-wide Internet. Three smaller Navy research facilities located in Monterey, CA, Orlando, FL and Bay St. Louis, MS are also part of NRL. All NRL facilities are interconnected via the Internet.

NRL's main library, the Ruth H. Hooker Research Library and Technical Information Center, makes extensive use of both the campus network and the Internet to serve many of the information needs of NRL researchers. CD-ROMs, Internet services, NRL-produced databases, and the Library's online catalog are all available through the Library's networked information system, known as the InfoNet. Researchers can access the InfoNet from in-library workstations, or from their own desktop computing systems in their offices or laboratories. All online services of the InfoNet can be accessed by any type of computer or dumb terminal through a single menuing system. Due to database licensing restrictions, the InfoNet currently serves only the Washington, DC campus of NRL; this restriction will be adjusted in the near future to accommodate remote NRL facilities.

2. THE INFONET

The InfoNet was developed in response to a June 1990 Strategic Plan on Laboratory Networking, which called for uniform access to onsite and external computer databases as part of the development of a fiber optic network. Also driving the development of the InfoNet was a user needs analysis conducted by the Library in the summer of 1990. As a result of interviews with 46 individuals representing a cross section of research interests, the Library learned that users wanted first of all to access information resources from their own computers and workstations. They wanted a system that would:

- Provide subject and author access to journal articles as well as books;

- Allow users to request materials as part of an online search;
- Offer access to multiple databases, both bibliographic and informational;
- Store full text files, such as journal articles or handbooks, for downloading;
- Provide access to the catalogs of other libraries and to external databases;
- Offer electronic document delivery from libraries or information providers.

The NRL Library therefore began to plan for an "information utility" that would serve as a single source for most of a researcher's or administrator's information needs and would, furthermore, be available from every user's desktop¹. The InfoNet system went online in September 1992 providing end users anywhere on the NRL campus with menu driven access to CD-ROMs, the library catalog and other Laboratory databases, and information resources and databases on the Internet².

3. INFONET FOR TELNET CONNECTIONS TO INTERNET HOSTS

Most researchers at NRL have Internet connectivity, however many find searching the Internet a difficult and often frustrating approach to meeting their information needs. Although many valuable information resources exist on the Internet, there is no centralized directory of people or services. Locating Internet search tools and information retrieval sites is time consuming when done on an individual-by-individual basis. The InfoNet provides researchers with facilitated access to those Internet resources that the Library has identified as particularly useful. For each service it makes available, the InfoNet provides the end user with automated connectivity and in many cases with online help capabilities to orient the user and provide search tips.

To enable end users to search Internet databases such as library catalogs and commercial information services, InfoNet provides end users with Telnet capabilities. Telnet is one of the TCP/IP suite of protocols which allows terminal access to remote hosts across the Internet. An end-user running Telnet software attaches to a host and receives data as a dumb terminal. After entering an appropriate login and password identification, the end-user is given access to any character-oriented database just as if he or she had a hardwired connection.

InfoNet provides Telnet access to a number of Internet resources by using Kermit scripting commands. Kermit is available via Anonymous FTP from Columbia University. End users need only select the desired option from the InfoNet menu and a connection is automatically made to the service. The automated connections include scripted login, password, terminal type and other requisite information and therefore requires no additional input on the part of the end user.

Services with scripted InfoNet access include the University of Maryland and Library of Congress library catalogs, CARL - The Colorado Alliance of Research Libraries, Dialog, OCLC FirstSearch, and current weather information from the University of Michigan Weather Underground service. Scripted Telnet is also used for end user access to the Library's online catalog, STILAS (Scientific and Technical Information Library Automation System), and the Laboratory Management Information System, LABMIS, with the NRL phone directory, personnel locator, and other internal information.

Library staff also have available a generic Telnet prompt to enable them to connect easily to other library catalogs and systems.

4. INFONET AS AN ANONYMOUS FTP SITE

Across the Internet there are literally thousands of freely distributable software applications and hundreds of hosts known as "ANONYMOUS FTP" sites. The software distributed on the Internet is considered non-commercial and falls into three broad categories: shareware, freeware, and public domain. These applications often meet only specialized needs, but some are truly exceptional and exceed their commercial equivalents in both functionality and technical support. The InfoNet utilizes much of this non-commercial software for

many of its functions. The InfoNet also serves NRL as an ANONYMOUS FTP site for freely distributable microcomputer software.

Using free FTP host software obtained from an ANONYMOUS FTP site at the Czech Technical University, the InfoNet provides network access to over a gigabyte of continuously updated freeware and shareware applications for both Macintoshes and PCs. Software includes utilities, clip art, virus detection, and other applications.

To access the InfoNet ANONYMOUS FTP site, end-users run freely distributed FTP (File Transfer Protocol) client software and enter the address of the host, which for NRL users is simply "LIBRARY." Once connected, end-users enter "ANONYMOUS" as a login ID and an E-Mail address as the password. End-users are then permitted to list guest directories and to copy software back to their own workstations.

5. INFONET USE OF GOPHER AND OTHER INTERNET SEARCH TOOLS

To search the vast network resources of the Internet, a number of TCP/IP based information discovery and retrieval tools, known as "Knowbots" (Knowledge Robots), are being developed. The ultimate goal is to create software applications which will "automatically roam the Internet, browsing for information and [retrieve] it when it matches an owner's needs." Although Knowbots are not yet a reality, a number of Knowbot prototypes are in existence, such as Gopher, WWW, WAIS, NNTP, and Archie. The InfoNet provides menu-driven access to some of these innovative services, including Gopher, NNTP, and Archie.

InfoNet provides direct Gopher support to users by providing them with menu access to Gopher client software. This allows users to query databases resident on Gopher servers throughout the world using a common interface. The user is relieved of any requirement to know anything about the computer host or the structure of the individual databases available.

Under the InfoNet's Internet Resources menu a Gopher client application connects InfoNet users to "Gopher Holes" such as the National Science Foundation (NSF) with its database of NSF grant awards and articles, and the International Center for Genetic Engineering and Biotechnology (ICGEB), Trieste, Italy, and its databases on genetics.

Access to Archie is provided to InfoNet users through the University of Maryland. Archie searches major ANONYMOUS FTP sites across the Internet and provides end-users with a list with the exact location of sought after software. The scientist is then able to FTP to an appropriate site and download the required software.

Recent statistics show that nearly twenty percent of all usage on the InfoNet is based on Knowbot prototype menu options.

6. INFONET FOR INTERNET E-MAIL

Through the InfoNet, all NRL Library staff are given an Internet E-Mail address. Using a combination of free E-Mail software, Pegasus-Mail for both Macintosh and PCs, and Charon as a STMP (Simple Mail Transfer Protocol) mail gateway, staff are provided with a user-friendly mail system. The InfoNet E-Mail system has numerous state-of-the-art features such as a menu driven editor, spell checking, file attachment capabilities, automatic announcements of new mail, and mail filtering (i.e., automatic separation of mail by user defined categories).

In addition to staff E-Mail accounts, InfoNet E-Mail provides researchers in their offices with several other important capabilities.

Internet Newsgroups

The InfoNet provides menu-driven access to the USENET electronic conferencing system with hundreds of discussion groups available worldwide. The InfoNet uses Trumpet Newsreader software available via

anonymous FTP form the University of Tasmania in Australia. Once a user selects "News Groups" from the InfoNet Internet Resources menu, an automatic connection is made to one of the USENET NewsServers.

Alias E-Mail Accounts

Alias forwarding accounts such as ILL@LIBRARY and BOOKS@LIBRARY have been created so that users can send questions and orders electronically to the appropriate Library staff. By using an Alias account, E-Mail can be easily forwarded to another staff member should the person who normally performs those duties be out sick or away on leave. In addition, the Alias E-Mail account is easier to remember and does not change even if the person who previously performed the duties moves to a new position.

ListServer Lists

A ListServ List is an electronic mail-based forum or discussion group. Members of a List contribute to the discussion by sending E-mail to the List's E-mail address. The messages are then redistributed to every other member of the List. Such a List, called MARLIN (Military Academic Research Libraries Network), has been established on InfoNet to facilitate communications and exchange of ideas among the Military Academic Librarians. Since it enables subscribers to post E-mail messages to the entire membership, it is a very efficient way to solicit information or help from a peer group. For example, a recent request was sent to all MARLIN participants by the Nimitz Library at the U.S. Naval Academy, asking if anyone had copies of a 1975 study of graduate programs in the Navy. Other ListServ forums are planned for InfoNet. They will permit the Library to disseminate electronically library publications, such as new book lists and reports announcements, and will provide users with a mechanism for making suggestions and resolving problems they may be experiencing with library service.

7. INFONET USAGE STATISTICS

The InfoNet has been available to the entire NRL community since September 1992. Usage has been steadily increasing and is approaching 3,000 accesses per month. One-third of all InfoNet access is related to connectivity to the Internet. The most popular Internet services are : Current Weather, Internet News Groups and OCLC FirstSearch.

8. FUTURE ENHANCEMENTS

The Library is currently planning a number of enhancements to the InfoNet system. The most important of these is access to formatted text files and page images to enable researchers to go beyond pointers to information (catalogs and bibliographic databases) to the information itself and to retrieve, view and print that information in its entirety.

Report and Journal Page Images

Although the Internet and CD-ROM resources currently provided to the NRL community through the InfoNet meet many of the scientists' information needs, they are limited primarily to ASCII text and therefore often lack the full informational content of technical reports and journal articles which may utilize complex equations, graphs, charts, and illustrations not expressed by ASCII. To provide researchers with all the information contained in a document, the Library plans to provide complete NRL reports in a formatted text file as well as ASCII format using the InfoNet as a FTP host and tracking system. The Adobe Acrobat product, to be released later this month, will be evaluated for this purpose.

The Library is also experimenting with the networking of full-page images. The Library has stored on an optical disk system and linked to its online reports catalog, images of 60,000 unclassified reports, representing about 3.3 million pages^{3,4}. The first increment of a networked imaging system will consist of about 3,000 NRL-originated reports. The Library plans to add one or more journals to the InfoNet imaging system in the near future. The use of Mosaic software being developed by the National Center for Supercomputing Applications (NCSA) is being explored for the network delivery of images to a variety of

user platforms.

Return E-Mail

One of the limitations inherent in supporting multiple computer types such as terminals is the lack of file transfer capabilities. InfoNet E-Mail has been adapted to provide a solution. Because of disk storage limitations, search results saved to disk during an InfoNet session are erased once the user exits the system. To overcome this limitation, the InfoNet has implemented a feature called Return E-mail. After an end user has saved search results to the InfoNet hard disk and exits the application, he or she can E-Mail the text files back to his or her own E-Mail account. Since almost every InfoNet user has an E-Mail account, the return E-Mail option allows even dumb terminal users to save search results in electronic format.

Other planned enhancements to the InfoNet include the following:

- Additional CD ROM subject categories and titles
- Direct WAIS and Archie support
- X-windows support
- Extension to remote NRL sites and dial-in access
- Network-based modem pool and fax server for library staff.

9. CONCLUSION

To facilitate the transfer of information at the Naval Research Laboratory, the NRL Library has created an information utility known as the InfoNet. Using CD-ROM databases and cutting-edge Internet search tools on a campus-wide network, the InfoNet meets many of the information needs of NRL researchers. The system itself is readily expandable and consists entirely of industry-standard components. Most importantly, the InfoNet provides researchers with information where and when they need it the most: at their desktops, 24 hours a day, and on their computing platform of choice.

With the widespread acceptance and use of advanced technology such as computer networking, distributed client-server processing systems, and optical disk technology, new paradigms for developing, storing, retrieving, and using information electronically are being created. Integrating these new technologies into an easy-to-use system, the InfoNet represents a major step toward attaining the Library's goal of providing NRL with a "Library without Walls."⁵

10. REFERENCES

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